

SIT4ME: seismic imaging of mineral-hosting structures in Sotiel-Coronada (Spain)

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1. Introduction

Our society is greatly dependent on raw materials and their ever-increasing demand puts their supply under strong pressure. The European Institute of Innovation and Technology (EIT) with its RawMaterials Programme promotes research and innovation solutions for sustainable mineral exploration (www.rawmaterials.eu). Within this framework, the SIT4ME project, supported by the EIT, aims to develop and assess seismic imaging approaches for mineral exploration within crystalline (hard-rock) environment, at a reduced cost. The SIT4ME project seeks to test the efficiency of different seismic approaches for subsurface imaging including: control and natural source seismic data-sets. Two world-class case studies are being developed in active mine sites (in Sweden and Spain).

3. Processing Geometry

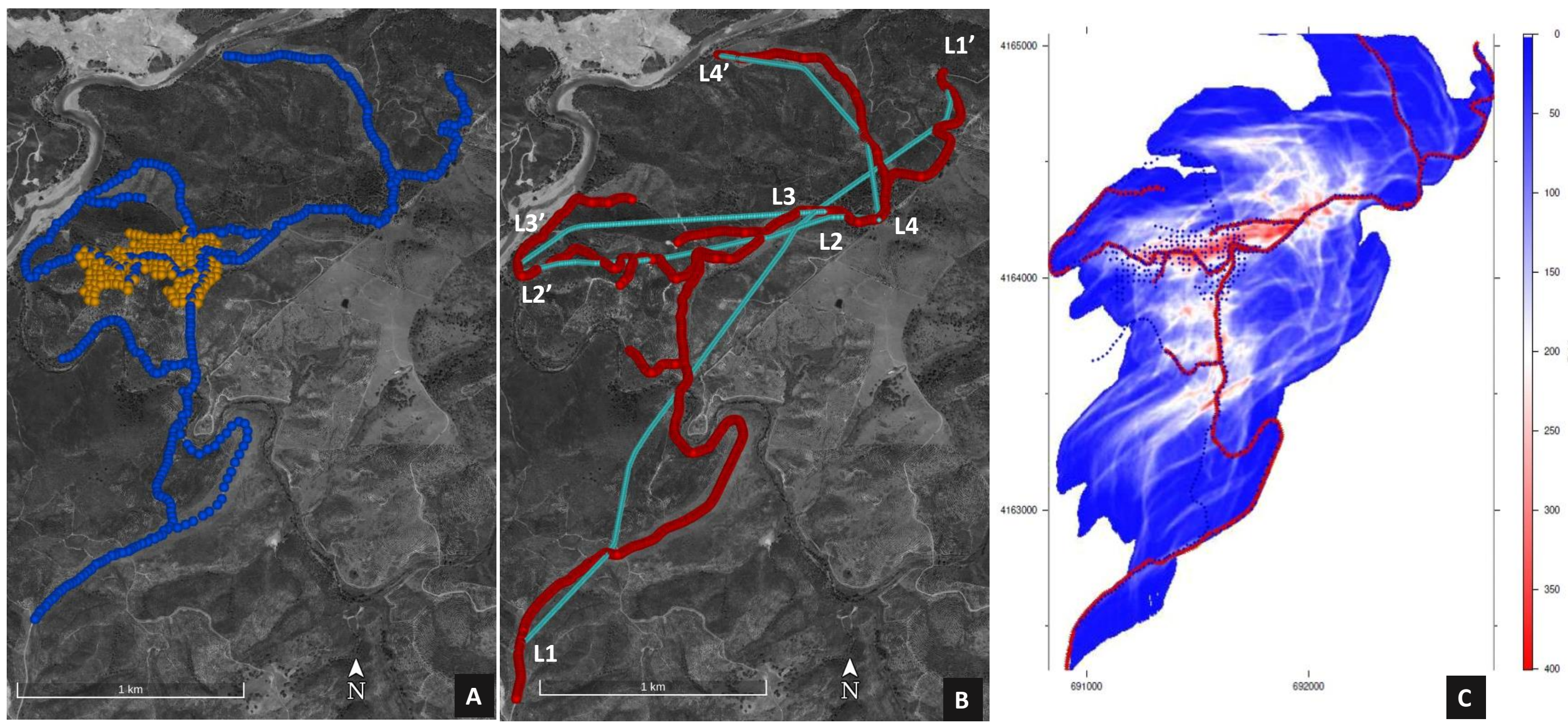


Figure 2: Distribution of the (A) geophones, (B) vibration points across the study area and seismic lines in light blue. (C) CDP fold coverage calculated from a CDP bin size of 5m.

No. of vibration points	875
Vibration points spacing	10 m
Source type	Vibroseis truck (32 t)
Sweep length	15 seconds
Frequency range	10-100 Hz
No. of receiver points	653
3-component receivers	247
1-component receivers	406
Sample rate	4ms
Receiver spacing	20m

Table 1: Data acquisition parameters

2. Geological setting

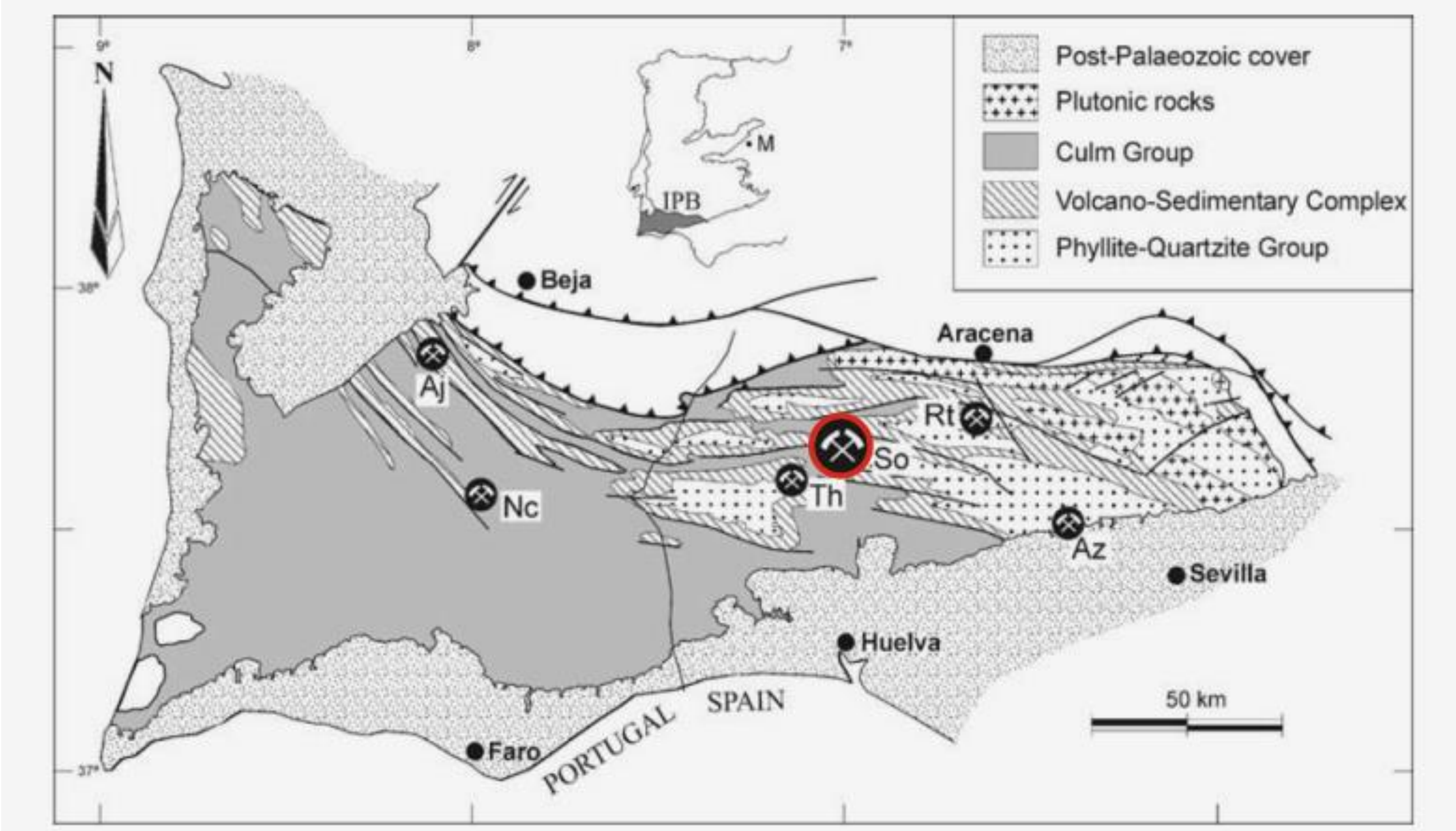


Figure 1: Geological map of the Iberian Pyrite Belt showing the location of the Sotiel Mine and the main mining districts. Gonzalez et al., 2006.

4. Data Processing

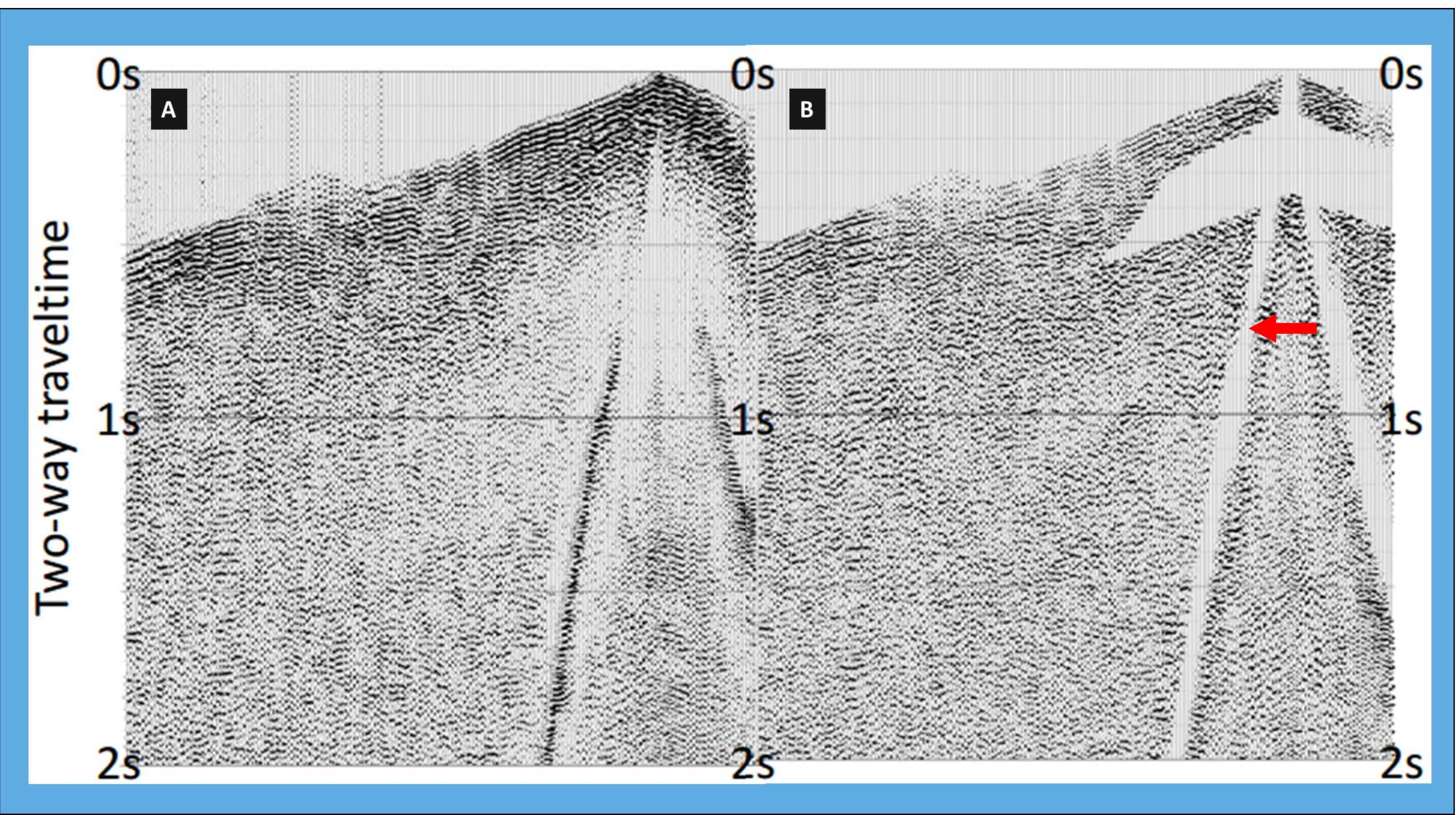
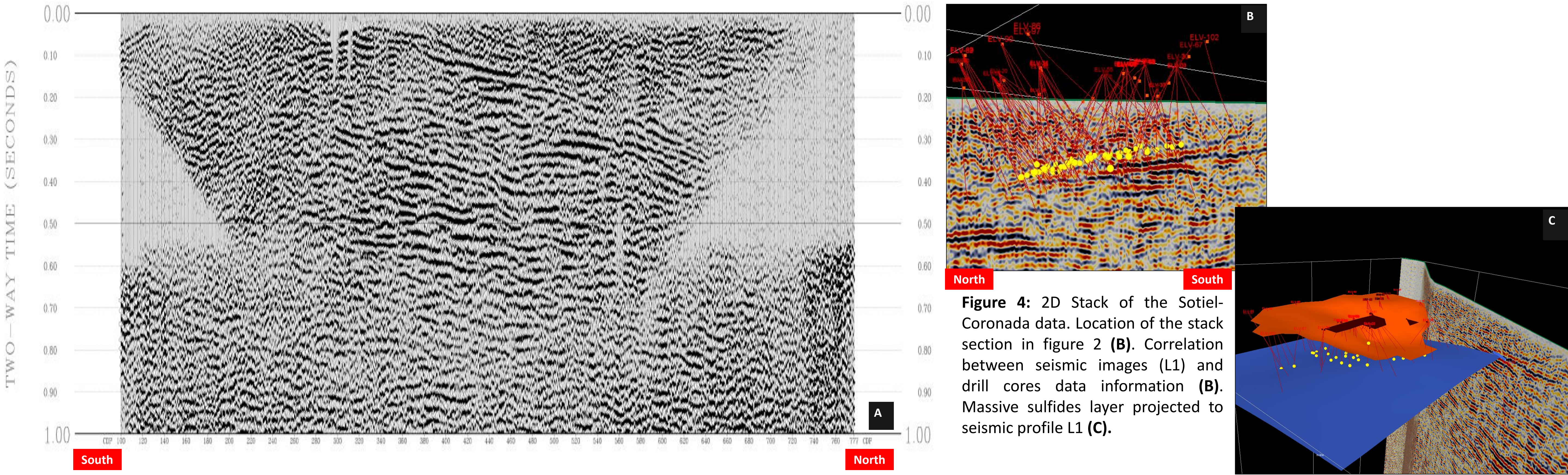


Figure 3: Shot gathers example from L1. A) Raw data and B) processed shot with a reflection marked by a red arrow. The data processing applied consist oy fin: noise trace edition, static corrections (elevation + refraction statics), airy wave mute (340m/s), surgical mute, amplitude equalization, frequency filter (20-30-65-90 Hz) and notch (50Hz).

5. Results



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References

Gonzalez, F., Moreno, C., and Santos, A., [2006], The massive sulphide event in the Iberian Pyrite Belt: confirmatory evidence from the Sotiel-Coronada Mine. Geol. Mag. 143 (6), pp. 821–827.